



DOE SNF Research and Development Needs

Phil Wheatley

June 8, 2000



*Providing for safe,
efficient disposition of
DOE spent nuclear fuel*

Technology Needs for Storage and Disposition of Spent Nuclear Fuel

- Action item from NSNFP Strategy Meeting, April 1999
- Worked closely with each major site
 - SRS Natraj Iyer/Bill Swift
 - ORNL Doug Turner
 - Hanford Bruce Makenas
 - INEEL Phil Winston



SNF Technology Needs Summary

- Identified 32 technology development needs
- Needs based directly on individual site SNF disposition priorities and path forward
 - SRS: Al fuel disposition via melt & dilute treatment or dry storage
 - Hanford: N-Reactor SNF removal from K basins to dry storage
 - INEEL: SNF to dry storage and road-ready preparations
 - ORNL: Cross-cutting interest in results of other site developments



National Program Continues to Work with EM-50 to Support SNF Research Needs

- EM Science Program Conference
- Nuclear Material Focus Area
- Gap Analysis & Strategic Laboratory Council



Providing for safe, efficient disposition of DOE spent nuclear fuel

EM Science Program

- DOE-ID is participating in the selection of research proposals
- Utilization of prior EM Science Program work



Providing for safe, efficient disposition of DOE spent nuclear fuel

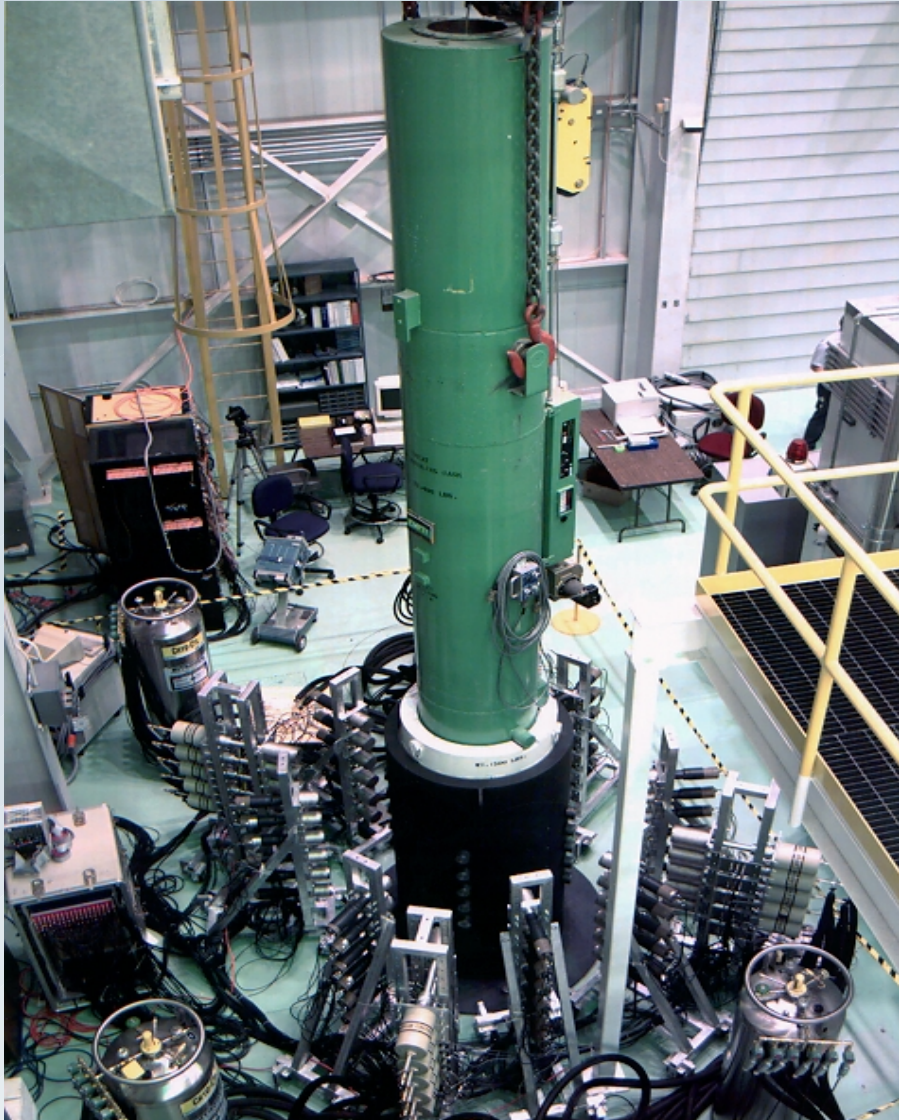
Working Closely with Nuclear Materials Focus Area

- Technology needs reviewed & prioritized
- FY-02 funding tentatively identified for SNF R&D efforts



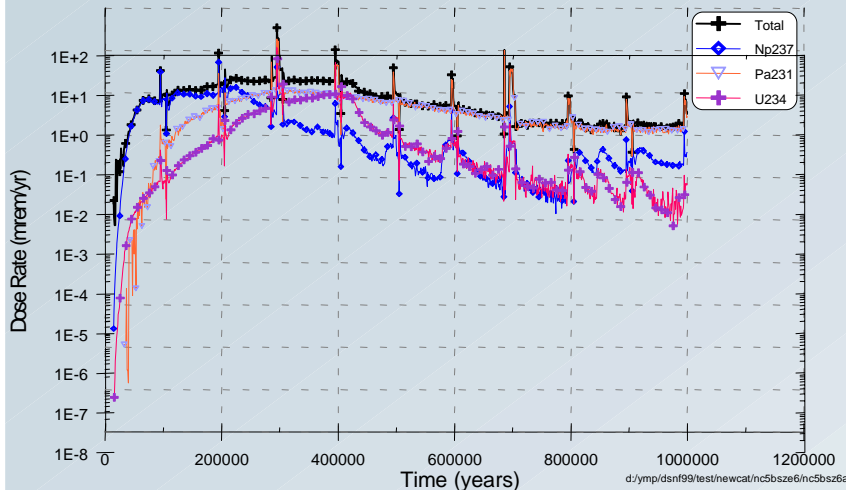
Providing for safe, efficient disposition of DOE spent nuclear fuel

The Multi-Detector Analysis System (MDAS) combines fundamental science and applied technology to characterize SNF

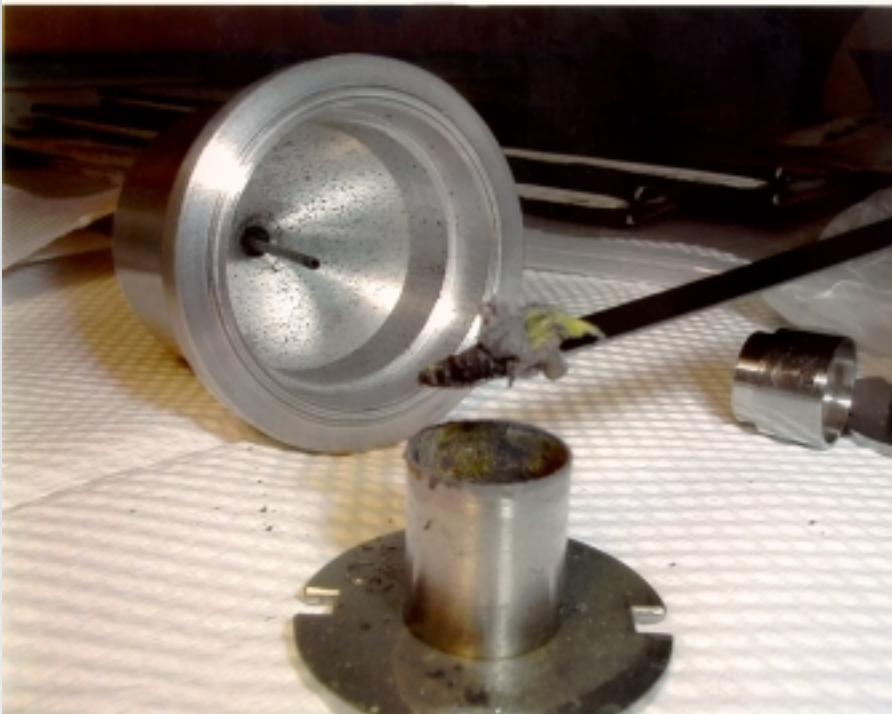


- Non-destructive assay system to measure fissile inventory
- No special calibration
- Independent of geometry
- Operates in high radiation fields

Repository Analysis



- Surface facility/canister performance allocation
- Post closure repository performance
 - Radionuclide release
 - Radionuclide transport
 - Criticality
- Material science
 - Packaging standards
 - Material corrosion and degradation
 - Chemical reactivity



Colloid Transport Evaluation

- Limited testing underway on U-metal and MOX
 - Evaluate the potential for generation of colloids from SNF degradation, the characteristics of such colloids, and possible resulting alterations to transport models



Summary

- The National Program continues to work with EM-50 Programs to:
 - Identify R&D needs
 - Secure EM-50 funding for R&D
 - Leverage current EM-50 R&D
- The National Program is directly funding basic R&D needs for repository disposal

